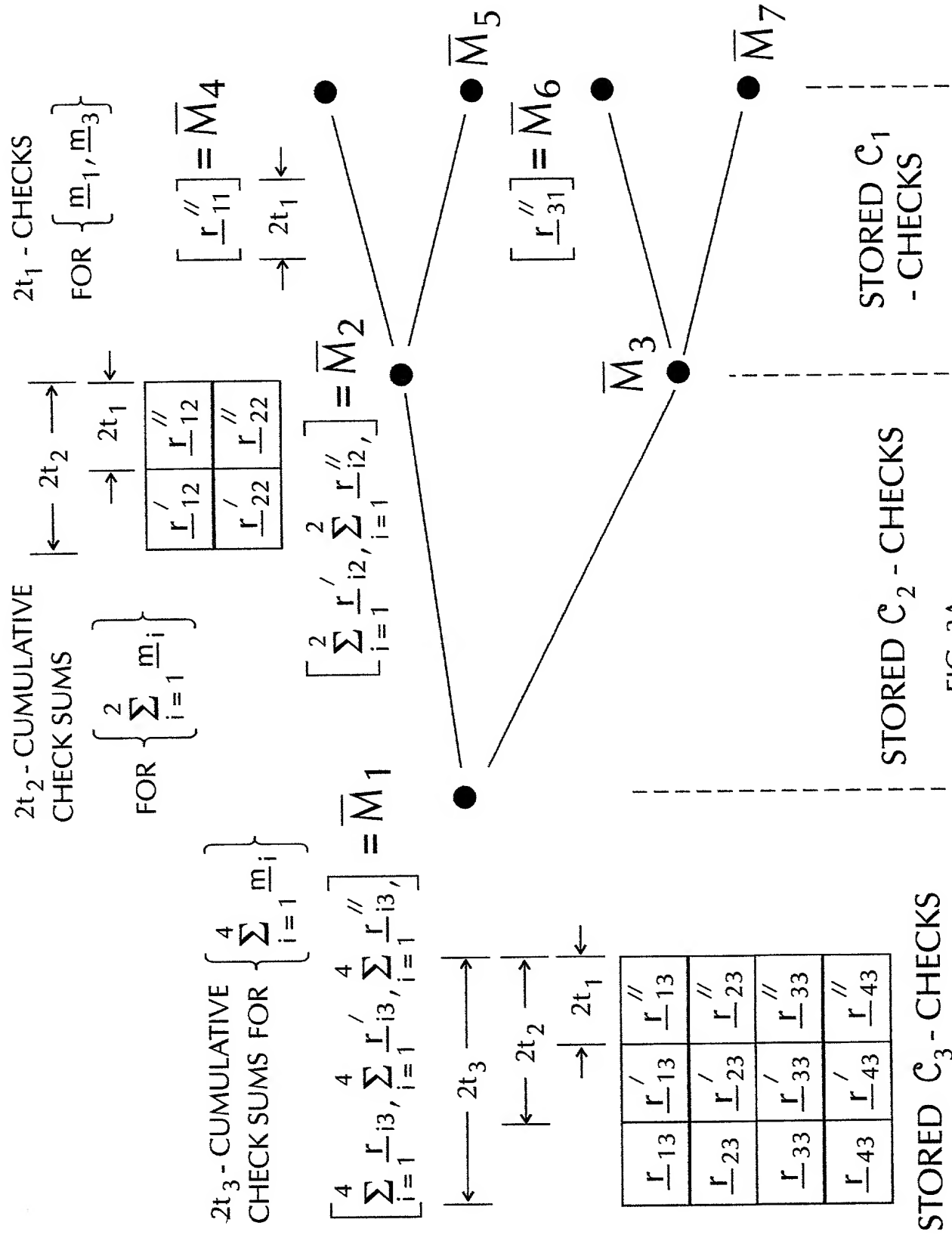


PARTIAL READ AND WRITE PATH DATA FLOW
IN A DIRECT ACCESS STORAGE DEVICE

FIG. 1
(Prior Art)



MULTI-LEVEL ENCODER

$$\overline{M}_4 =$$

$$\boxed{r_{-11}''}$$

$$r_{-1} \Rightarrow$$

\underline{m}_1	r_{-1}
-------------------	----------

$$\overline{M}_2 =$$

$$\boxed{\sum_{i=1}^2 r_{-i2}' \quad \sum_{i=1}^2 r_{-i2}''}$$

$$r_{-a} \quad r_{-2} \Rightarrow$$

\underline{m}_2	r_{-a}	r_{-2}
-------------------	----------	----------

$$\overline{M}_6 =$$

$$\boxed{r_{-31}''}$$

$$r_{-3} \Rightarrow$$

\underline{m}_3	r_{-3}
-------------------	----------

$$\overline{M}_1 =$$

$$\boxed{\sum_{i=1}^4 r_{-i3} \quad \sum_{i=1}^4 r_{-i3}' \quad \sum_{i=1}^4 r_{-i3}''}$$

$$r_{-c} \quad r_{-b} \quad r_{-4} \Rightarrow$$

\underline{m}_4	r_{-c}	r_{-b}	r_{-4}
-------------------	----------	----------	----------

CHECK EQUATIONS

$$\boxed{r_{-1} = r_{-11}''}$$

$$\boxed{r_{-a} = \sum_{i=1}^2 r_{-i2}' \quad r_{-2} = r_{-11}'' + \sum_{i=1}^2 r_{-i2}''}$$

$$\boxed{r_{-3} = r_{-31}''}$$

$$\boxed{\begin{aligned} r_{-c} &= \sum_{i=1}^4 r_{-i3} \quad r_{-b} = \sum_{i=1}^2 r_{-i2}' + \sum_{i=1}^4 r_{-i3}' \\ r_{-4} &= r_{-1} + r_{-2} + r_{-3} + \sum_{i=1}^4 r_{-i3}'' \end{aligned}}$$

$$\underline{C_1 \subseteq C_1}$$

\underline{m}_1	r_{-1}
-------------------	----------

$$\underline{C_2 \subseteq C_1}$$

\underline{m}_2	r_{-a}	r_{-2}
-------------------	----------	----------

$$\underline{C_3 \subseteq C_1}$$

\underline{m}_3	r_{-3}
-------------------	----------

$$\underline{C_4 \subseteq C_1}$$

\underline{m}_4	r_{-c}	r_{-b}	r_{-4}
-------------------	----------	----------	----------

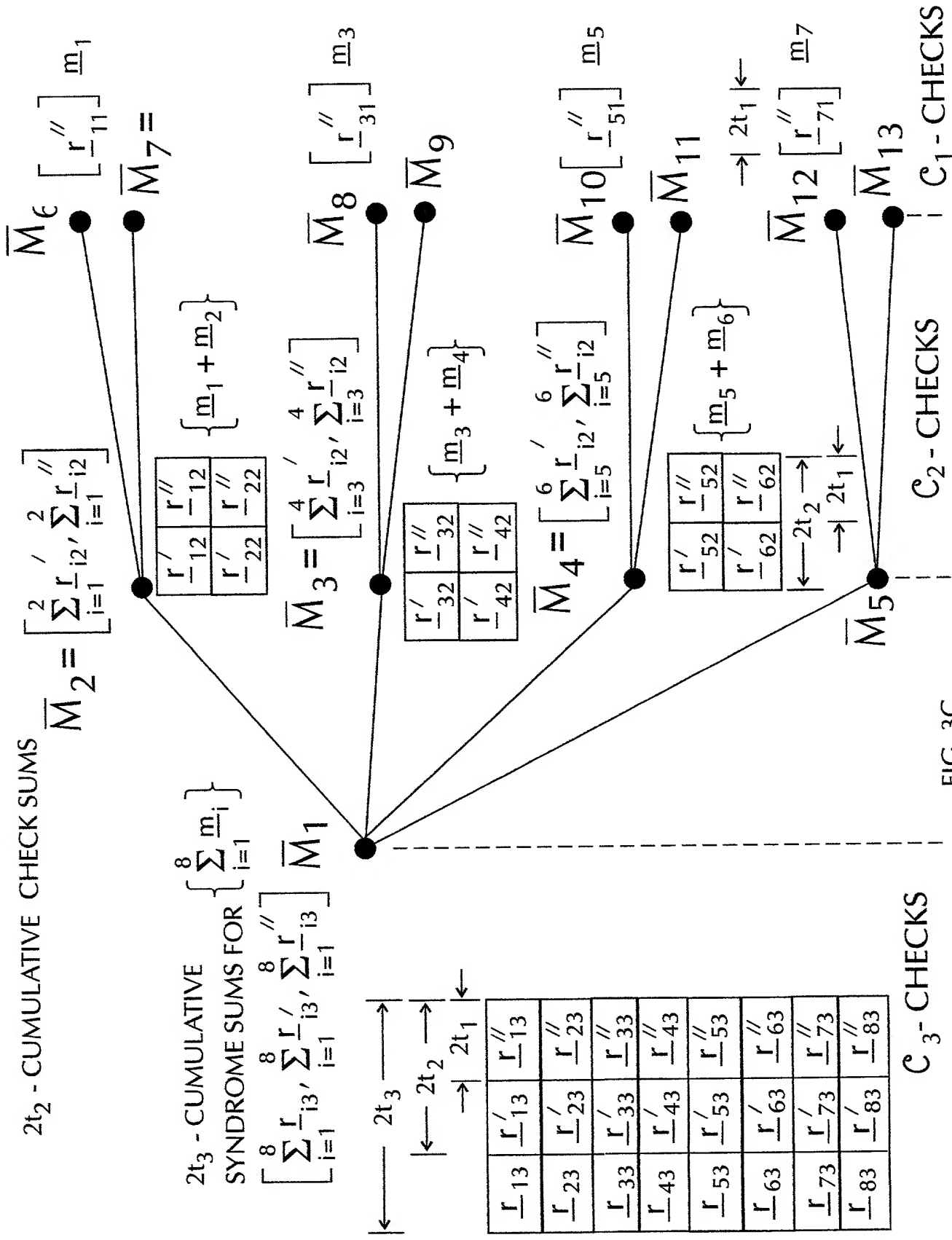
$$\underline{C_1 + C_2 \subseteq C_2 \subseteq C_1}$$

$$\underline{C_3 + C_4 \subseteq C_2 \subseteq C_1}$$

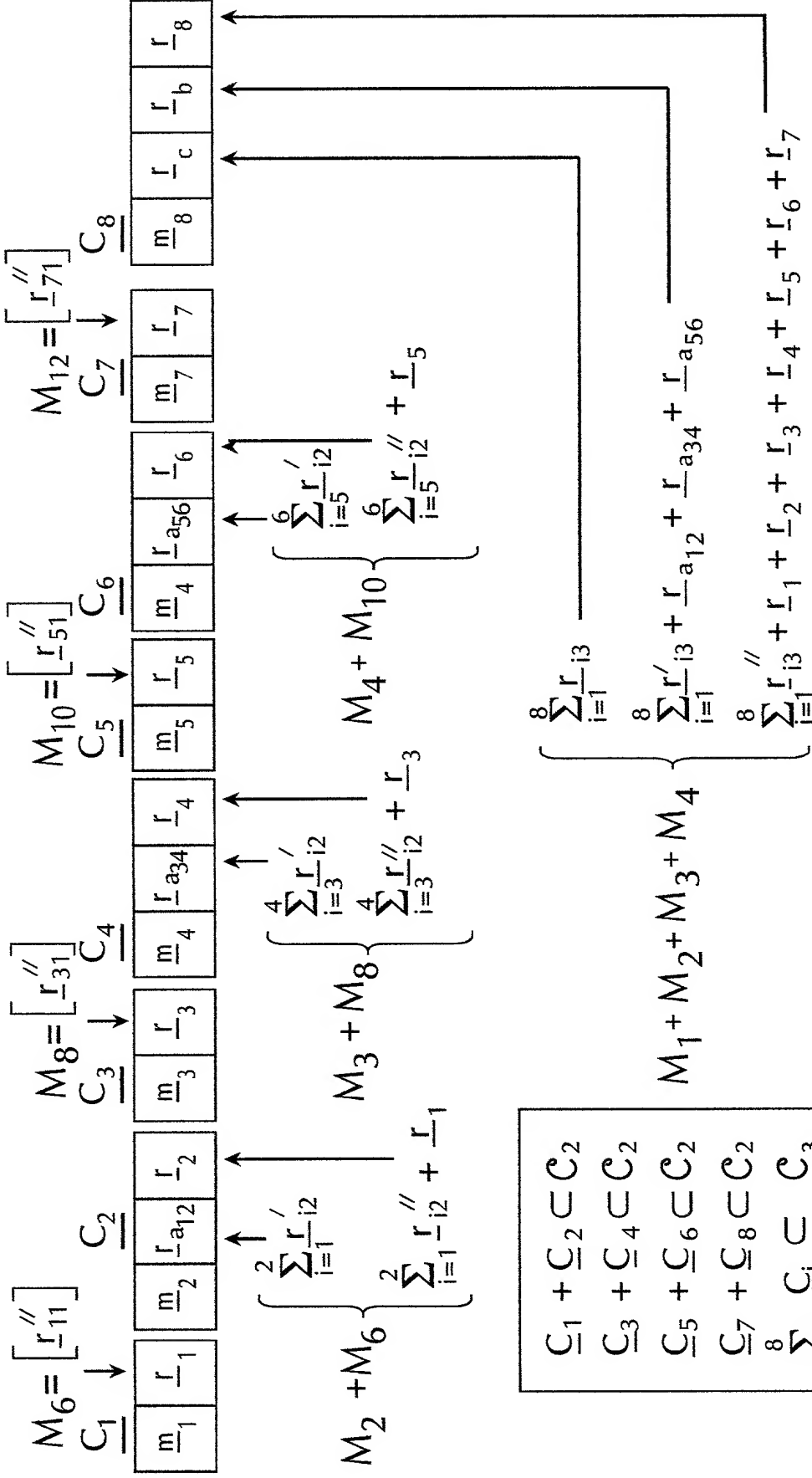
$$\underline{C_1 + C_2 + C_3 + C_4 \subseteq C_3 \subseteq C_2 \subseteq C_1}$$

INTEGRATED 4-SECTOR FORMAT

FIG. 3B



MULTI-LEVEL ENCODER CHECK EQUATION



INTEGRATED 8-SECTOR FORMAT

$$C_3 \subset C_2 \subset C_1$$

FIG. 3D

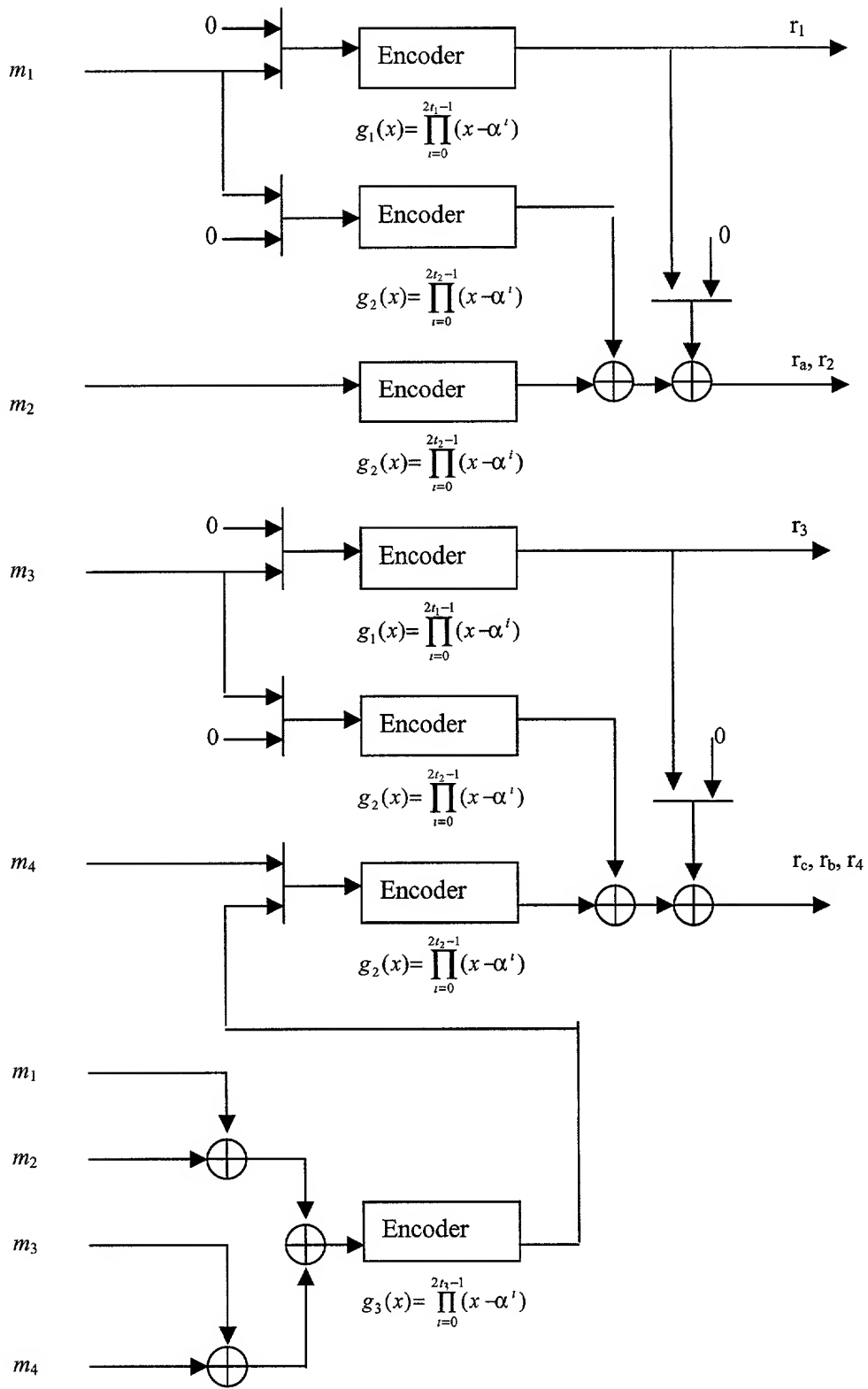


FIG. 4

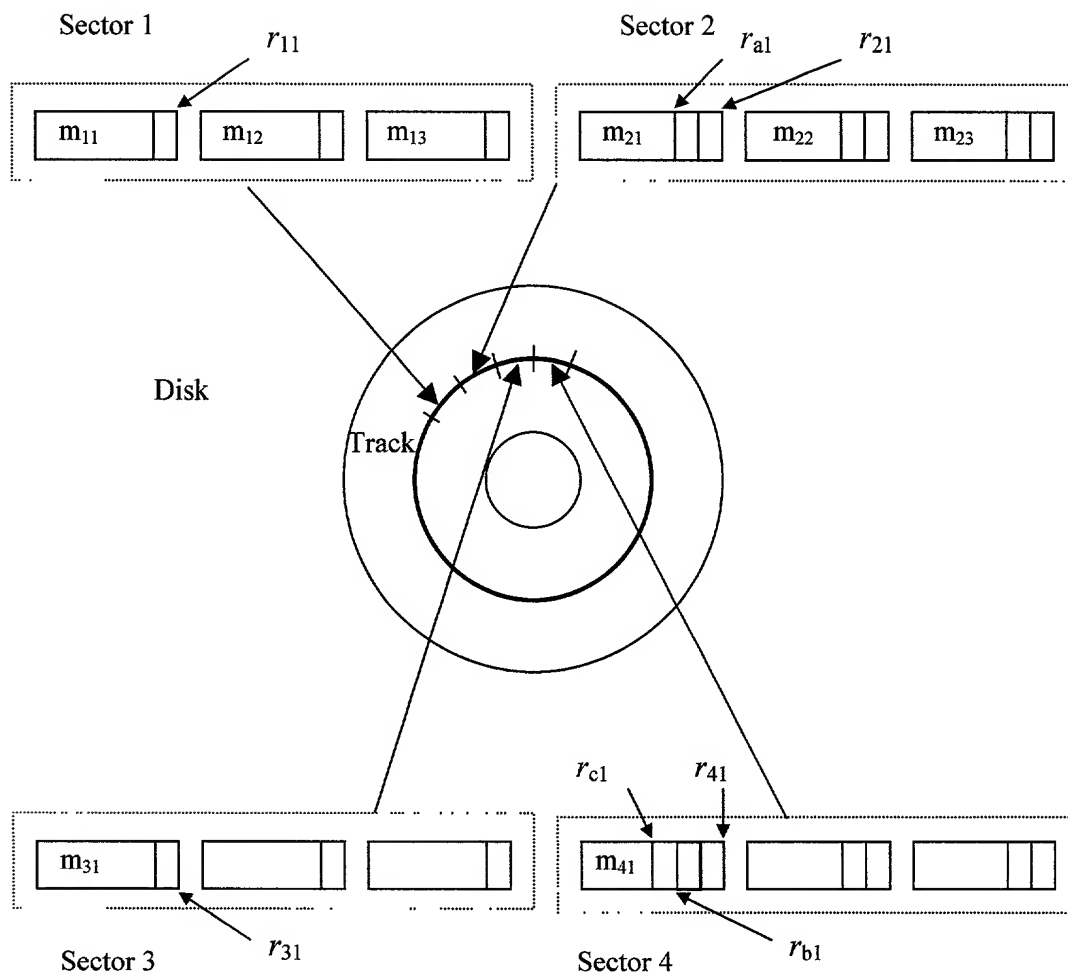


FIG. 5

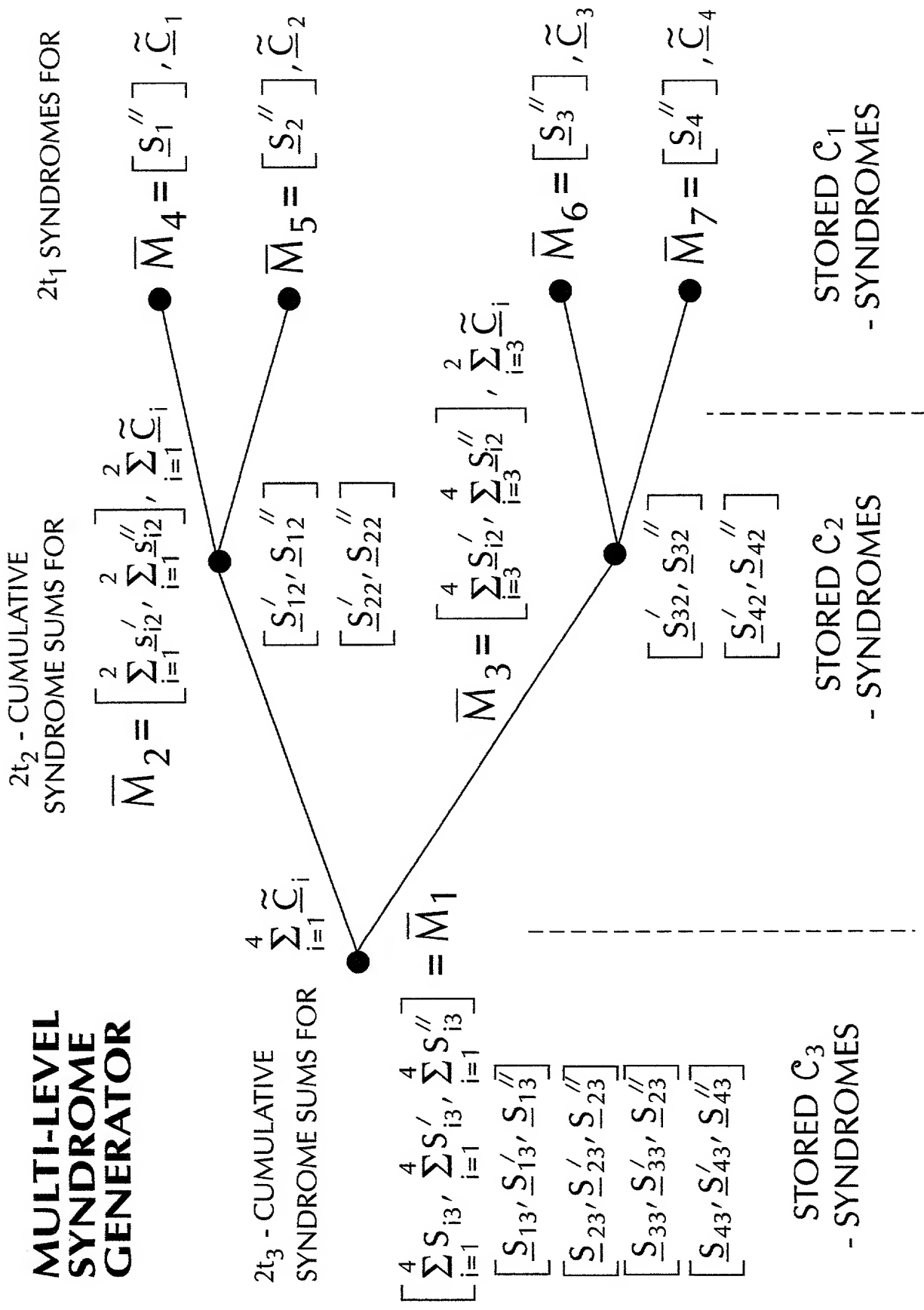


FIG. 6

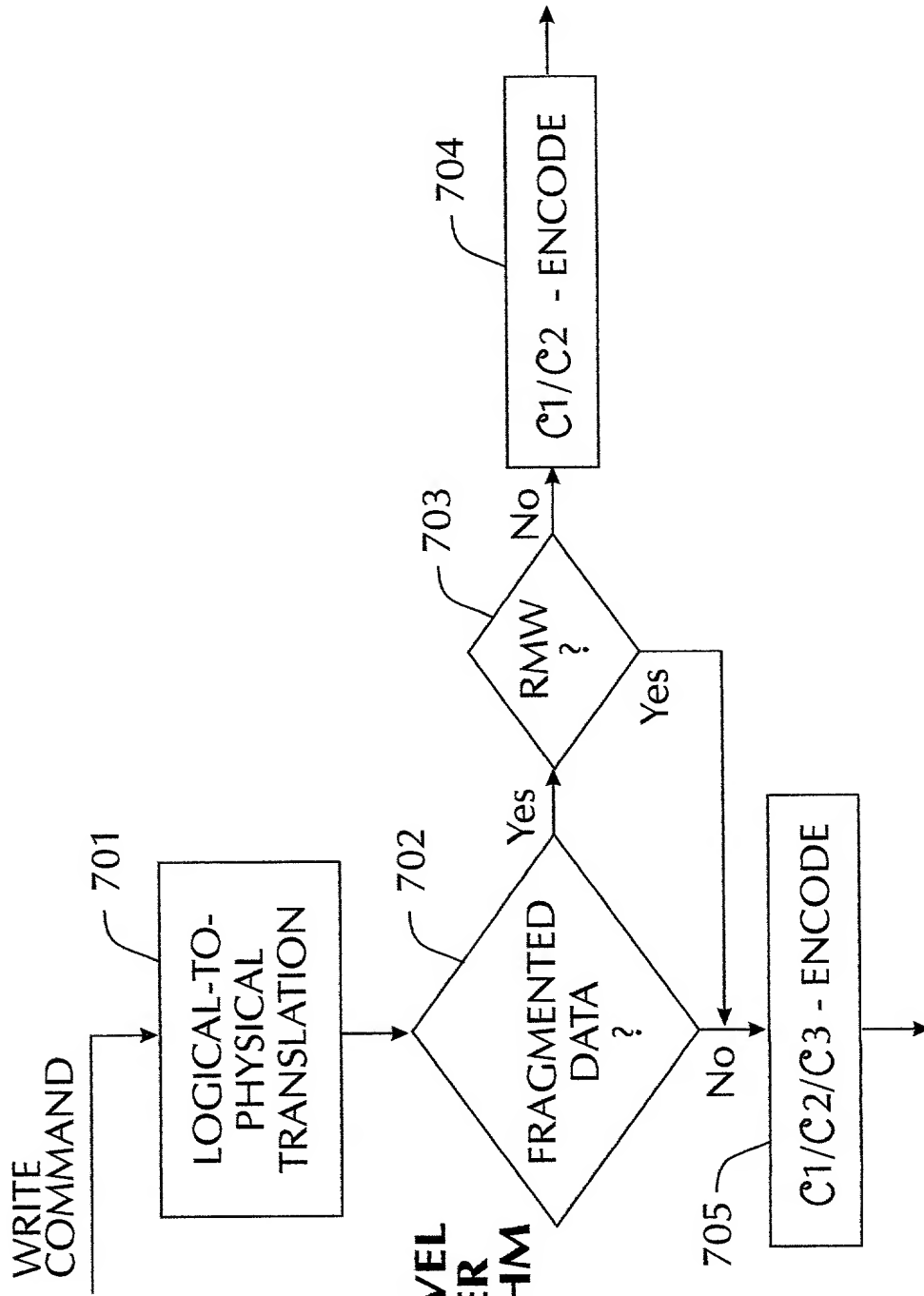


FIG 7
MULTI-LEVEL
ENCODER
ALGORITHM
700

FIG. 8
MULTI-LEVEL
DECODER
ALGORITHM
800

